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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/068,384	02/07/2002	Minoru Sudo	S004-4651	6137

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ADAMS & WILKS  
31ST FLOOR  
50 BROADWAY  
NEW YORK, NY 10004

EXAMINER

NGUYEN, JIMMY H

ART UNIT	PAPER NUMBER
2673	7

DATE MAILED: 07/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/068,384

Applicant(s)

SUDO, MINORU

Examiner

Jimmy H. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 03 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6-10, 12-17 and 24-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-10, 12-17 and 24-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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### DETAILED ACTION

1. This Office Action is made in response to applicant's amendment filed on 05/03/2004 (entered into the file wrapper as Paper No. 6). Claims 1-4, 6-10, 12-17 and 24-29 are currently pending in the application. An action follows below:

#### *Priority*

2. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in 10/068,384 on 02/07/2002. It is noted, however, that applicant has not filed a certified copy of the JP 2001-032261 and JP 2002-020623 applications as required by 35 U.S.C. 119(b).

#### *Claim Objections*

3. Claim 4 is objected to under 37 CFR 1.75(a) because although this claim meets the requirement 112/2d, i.e., the metes and bounds are determinable, however, the feature, "an external signal", lines 4-5, should be changed to -- said external signal --, because of its sufficient antecedent basis for this feature in the claim. See independent claim 1, line 8.

It is in the best interest of the patent community that applicant, in his/her normal review and/or rewriting of the claims, to take into consideration these editorial situations and make changes as necessary.

#### *Claim Rejections - 35 USC § 112*

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 8, 9 and 25-28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which

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was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding to these claims, the disclosure, when filed, does not fairly contain information regarding to the claimed features, “the LEDs are periodically turned on and off at certain time intervals in a time-division manner based on operation of the boosting circuit”, of independent claim 8, last 3 lines, and “at least one of the LEDs is periodically turned on and off at certain time intervals in a time-division manner based on the boosting operation”, of independent claim 9, last 4 lines. The disclosure, specifically fig. 14 and the description on page 18, lines 14-17, discloses “Since blinking of the LEDs 19 and 20 is controlled by the switch control circuit 3, ON/OFF control of the boosting circuit is performed by using the anode voltage of the lighted LED”, i.e., the LEDs are periodically turned on and off **based on the operation of the switch control circuit 3**, but **not** based on the operation of the boosting circuit, as presently claimed, and the operation of the boosting circuit is based on the anode voltage of the lighted LED which is turned on. Accordingly, the original disclosure does not fairly convey to one of ordinary skill in the art that inventor(s) had in their possession the above underlined features presently recited in claims 8 and 9.

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. Claims 1-4, 6, 7, 10, 12-17, 24 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoshino et al. (USPN: 6,628,252 B2), hereinafter Hoshino, and further in view of Worley, Sr. et al. (USPN: 6,486,726 B1), hereinafter Worley.

As per claims 1, 4, 10, 14 and 24, the claimed invention reads on Hoshino as follows: Hoshino discloses a LED driver circuit (as shown in fig. 5) comprising a plurality of LEDs (15a, 15b), and a constant current drive circuit (4) (a circuit 4 including elements 31, 37, 41-43, Q1-Q3 and Rs, see fig. 5) for driving the plurality of LEDs (15). See col. 4, lines 43-47, col. 4, line 63 through col. 5, line 42. Further, as noting at col. 5, line 46 through col. 6, line 16, and at col. 8, lines 19-30, Hoshino further teaches means for periodically turning on and off LEDs at a frequency in the range from 100 KHz to 700 KHz. Hoshino does not disclose expressly a plurality of switches and a switch control circuit, as presently claimed. Accordingly, Hoshino discloses all the claimed limitations of these claims, except that Hoshino fails to teach a plurality of switches and a switch control circuit, as presently claimed.

However, Worley discloses a related LED drive circuit (200) (see fig. 2, col. 5, line 34) comprising a plurality of switches (switches 730, 735, see fig. 7A, col. 10, line 17) connected to respective ones of the LEDs (LED1 705, LED2 710, fig. 7A) for periodically turning on and off the LEDs (705, 710) at certain time intervals (see fig. 7B, col. 10, lines 35-55); and a switch control circuit (a ring counter 715, fig. 7A, col. 10, line 12) for controlling the switches (705, 710) in response to an external signal (a control logic signal from an external source, col. 6, lines 14-15) to cause the LEDs (705, 710) to blink in a time-division manner. See figs. 2, 3, 7A and 7B, col. 6, lines 14-24, and col. 10, lines 35-55. Further, Worley teaches that the LED driver circuit preferably alternately turns "on" the LEDs at a high enough switching frequency so that

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the LEDs appear to be continuously turned on to the human eye (col. 10, lines 59-63), thereby obviously reducing the power consumption. It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to provide a plurality of switches and a switch control circuit in the Hoshino LED driver circuit, in view of the teaching in the Worley reference, because this would reduce the power consumption. Therefore, it would have been obvious to one of ordinary skill in the art to combine Worley with Hoshino to obtain the invention of these claims.

Regarding to claims 2, 12 and 29, Hoshino further teaches the LEDs (15) blinking or turning on and off at a frequency in the range from 100 KHz to 700 KHz, i.e., at a rate higher than a visual perception rate (col. 5, line 46 through col. 6, line 16). Worley also teaches the LEDs (15) blinking or turning on and off at a frequency of 40 Hz or above and at a rate higher than a visual perception rate (col. 7, lines 6-21, col. 10, lines 59-63).

Regarding to claims 3 and 13, Worley further teaches the constant current value of about 17 mA (col. 2, lines 4-7, col. 7, lines 16-18).

Regarding to claims 6, 7, 15 and 16, as noting in fig. 5 and at col. 2, lines 49-54, col. 5, lines 19-42, Hoshino further teaches the constant current circuit having an external terminal for receiving a control signal (CONT) from a controller or a microcomputer, for setting the constant current value, which varies in accordance with temperature.

Regarding to claim 17, Hoshino discloses a LED driver circuit (as shown in fig. 5) further comprising a boosting circuit for boosting a power supply voltage ( $V_s$ ) 1.5 times, 2.5 times, 3.5 times, etc., and for outputting a boosted voltage at a terminal 4a for driving the LEDs (15). Hoshino does not disclose expressly boosting the power supply voltage when the current falls

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below a predetermined value. However, Worley expressly teaches the LED driver circuit further comprising a boosting control circuit (a circuit including a comparator 1025, fig. 10) for providing a control signal (1055) (see fig. 10) to control a boosting circuit (a circuit including elements 1005, 1015, 1035, 1010 and 1040, see fig. 10) for boosting a power supply voltage (Vdd) when the current falls below a predetermined value (see fig. 10 and the description, col. 12, line 15 through col. 13, line 7. Furthermore, since the boosting circuit operates based upon a comparison (see col. 3, lines 58-62), the power consumption is obviously reduced. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention was made to provide a boosting control circuit in the Hoshino LED driver circuit, in view of the teaching in the Worley reference, because this would further reduce the power consumption.

#### *Response to Arguments*

8. Applicant's arguments with respect to currently amended independent claims 1 and 8-10, pages 12-14, have been considered but are moot in view of the new ground(s) of rejection. See the rejections above.

9. It is noted Applicant that the claim objections, the rejection under 35 USC 112, first paragraph, the rejections under 35 USC 102 and the rejections under 35 USC 103, in the last Office Action dated 01/29/2004, are hereby withdrawn in view of the amendment filed on 05/03/2004.

#### *Conclusion*

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jimmy H. Nguyen whose telephone number is (703) 306-5422. The examiner can normally be reached on Monday - Thursday, 8:00 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached at (703) 305-4938.

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

**or faxed to:**

**(703) 872-9314 (for Technology Center 2600 only)**

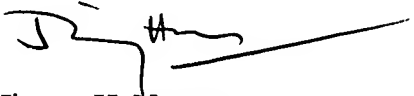
Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).



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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

JHN  
July 1, 2004



Jimmy H. Nguyen  
Examiner  
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